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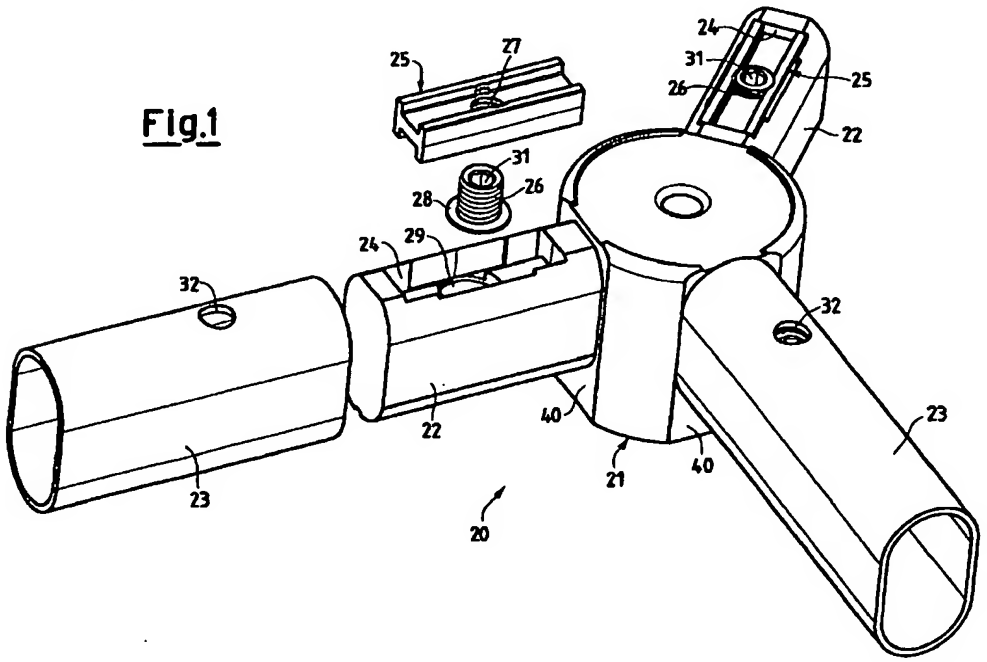
(54) Joining device for the creation of load-bearing systems for workstations

(57) A joining device for the creation of load-bearing systems for workstations comprises, in combination: a body (21) from which there extends an attachment (22) on which a tubular section (23) is designed to be fitted, and fixing means capable of joining said attachment (22) and tubular section (23)stably together. According to the invention said fixing means consist of at least one beam (25) acting between said attachment (22) and tubular section (23), said beam (25) being housed within a seat (24) of said body (21) and being movable between one first position in which the beam (25) is basically contained within the seat (24) and one second position in which the beam (25) is loaded, by adjustment means, to bias the attachment (22) and the tubular section (23) so that they engage with one another.

Fig.1



EP 0 976 346 A2

Descripti n

[0001] The present invention refers to certain interesting improvements made to joining devices of the type used for creating load-bearing systems for workstations, particularly but not exclusively for offices.

[0002] Known joining devices are, for example, described in US-2817547, US-3008741, US-3638803, and EP-847715.

[0003] As is well known to the experts of the sector, in the creation of load-bearing structures for workstations, for example those destined for offices, in addition to compliance with current standards, the requirements listed hereinafter must be met, these requirements being generally common to all these types of structures.

[0004] First of all, it is highly desirable to make a joining device whereby it is possible to obtain workstations having configurations, dispositions and external appearance as varied as possible according to the practical needs and desires of the user and also of the environment in which the workstation is to be located.

[0005] It is moreover desirable to identify a load-bearing structure for desks which, in addition to having a relatively low cost, may also present maximum operating flexibility in terms of solutions achievable without any technological limits in terms of shape and size. This characteristic greatly facilitates the design of workstati ns by manufacturers, also in terms of investments (i.e., they must be quite cheap), in plants necessary for the creation of the load-bearing structures themselves.

[0006] It would then be desirable that also firms not specialized in the manufacture of office furniture might have the possibility of proposing, upon request, workstations adequate for the present needs.

[0007] The structure created should be as solid and stable as possible over time, without risks of deteriorati n due to the materials used.

[0008] It would then be important that the supporting structure of the work surface were in itself self-supporting, without any contribution of the surface itself for the rigidity of the system.

[0009] It should be possible to make the workstation without the use of particular equipment and it should be possible to modify it as regards the way it is set up at any moment, adding, removing or changing the combination of the elements.

[0010] It should be possible to disassemble the structures built and separate them into their single elements in the absence of welds, and then to put them back together to form different solutions, or else, it should be possible to recycle them as raw material.

[0011] The general purpose of the present invention is to propose a joining device for making load-bearing systems for workstations that adequately meets all the requirements listed above, with particular reference to the flexibility of use, the production costs, which must be very contained, and the absolute rigidity over time of the structure obtained, also in the presence of relatively demanding stresses.

[0012] The above-mentioned purpose is achieved by a joining device having the characteristics set forth in the attached main claim and secondary claims.

[0013] The structural and functional characteristics of the invention and its advantages with respect to the known art will be more clearly understandable from an examination of the following description thereof, made with reference to the attached drawings, which show practical examples of embodiment of the invention. In the drawings:

- Figure 1 is an exploded perspective view illustrating one possible practical embodiment of a joining device according to the invention;
- Figure 2 is a schematic plan view of the joining device of Figure 1, through which three tubular sections forming part of a load-bearing system for workstations (not shown) have been interconnected;
- Figure 3 is an exploded sectional view illustrating the joining device in the position for receiving a tubular section of said load-bearing system;
- Figure 4 is an enlarged detail of Figure 3;
- Figure 5 is a sectional view taken according to the plane of trace V-V of Figure 2;
- Figure 6 is an enlarged sectional view taken according to the plane of trace VI-VI of Figure 2, illustrating the joining device in the position of insertion onto it of the tubular section;
- Figure 7 is an enlarged sectional view taken according to the plane of trace VII-VII of Figure 6, illustrating the condition of reciprocal stable fit between the joining device and the tubular section;
- Figures 8 and 9 are two sectional views, like those of Figures 6 and 7, but taken, respectively, according to the plane of trace VIII-VIII and the plane of trace IX-IX of Figure 2, where, for reasons of clarity of the drawing, illustration of the headless screw for adjusting the fixing beam has been omitted;
- Figure 10 is an enlarged perspective view, cut away and sectioned, illustrating the joining device according to the invention, with particular reference to the headless screw for adjusting the fixing beam;
- Figures 11 and 12 are two sectional views, respectively exploded and assembled, illustrating the fitting of the joining device according to the invention to a tubular leg;
- Figures 13 and 14 are two views like those of Figures 11 and 12, but illustrating another possibility for fitting the joining device according to the invention to a tubular leg; and
- Figures 15 to 19 illustrate various possible configurations of joining devices according to the invention.

[0014] With reference first of all to Figures 1 to 5 and 10 of the drawings, a joining device according to the invention is indicated, as a whole, by 20, and is structur-

ally mad up of a body 21 from which at least one attachment 22 extends. Onto said attachment 22 there is designed t be slid and rigidly fixed a tubular section 23, generally made of metal, having a complementary section and forming part of a load-bearing structure for workstations and the like (not shown).

[0015] In the example illustrated in Figures 1 to 5 of the drawings, from the body 21 - which in this case is central - there extend three attachments 22, but, as has been pointed out above, these attachments 22 may be in number other than three, as shown in the examples of Figures 15-19 of the drawings.

[0016] The body 21 and attachments 22 can be made of a single piece, for example of metal or plastic material having the necessary physical and mechanical characteristics for the purpose of the device.

[0017] According to the present invention, in each individual attachment 22 is made a seat 24 for a beam 25 which has the function of ensuring stable and durable fixing over time between a tubular section 23 and the attachment 22 itself.

[0018] Said beam 25, for example a metal beam and one having a preferably double-T-section is housed in its seat 24 so as to be movable (parallel to itself) between the lowered, non-operative, position of Figures 3, 6 and 8 and the raised, operative, position of Figures 5, 7 and 9.

[0019] Displacement of the beam 25 with respect to the complementary seat 24 is performed by means of a threaded headless adjustment screw 26, which is screwed through a corresponding threaded hole 27 made centrally in the beam 25 itself.

[0020] For this purpose, the headless screw 26 is provided with a discoidal base 28 housed in a corresponding cavity 29 (Figures 3 to 5) located on the bottom of the seat 24.

[0021] Said cavity 29 is moreover preferably provided with a perimetral edge 30 for retention of the base 28, which snap-fits into the cavity 29 itself.

[0022] The adjustment of the headless screw 26 is performed using a polygonal spanner (not shown) which is inserted into a complementary seat 31 of the headless screw 26.

[0023] Access to the headless screw 26 is via an aligned hole 32 made in the tubular section 23.

[0024] As is clearly shown in Figures 11-14, the body 21 is preferably made in such a way as to enable fitting thereof to a tubular leg 33.

[0025] The fitting systems between the body 21 and the leg 33 may be of various kinds. For example, a nut 34 may be used, which is screwed directly on a threaded shaft 35 extending centrally from a disk 36 fixed to the leg 33 (Figures 11 and 12); or else, a bolt 37 may be used which screws through a threaded hole 38 of a disk 39 fixed to the leg 33 (Figures 13 and 14).

[0026] By 40 are indicated abutting contrast surfaces of the free nd of the tubular section 23, which are provided on the perimeter of the body 21.

[0027] Operation of the joining device according to the invention is clear from the above description with reference to the figures, and in short is as follows.

[0028] A tubular section 23 having a cross section complementary to that of the corresponding attachment 22 is fitted on the latter with the beam 25 in the position where it is retracted inside its complementary seat 24, as shown in Figures 3, 6 and 8 of the drawings.

[0029] In this position, the end of the tubular section 23 bears upon the contrast surface 40 of the body 21 from which the attachment 22 extends, so that the hole 32 of the tubular section 23 comes to be aligned with the seat 31 of the adjustment screw 26.

[0030] In this way, using an Allen wrench (not shown), the headless screw 26 can be turned so as to load the beam 25, so that it is translated upwards in the direction of the arrow 41 (Figures 6 and 8).

[0031] Consequently, the external flanges of the beam 25 engage on the inner surface 42 of the tubular section 23, so as to load, in the direction of the arrows 43 and 44, the attachment 22 so that it engages stably with the tubular section 23 at a large common perimetral surface 45, which occupies almost the entire cross section of the two assembled components 22, 23, except for the area where the beam 25 - adjusted by the headless screw 26 - exerts its thrust.

[0032] The tubular section 23 may be separated from the attachment 22 by unscrewing the headless screw 26 so as to bring the beam 25 back into the lowered position of Figures 3, 6 and 8. It should be noted that in this position the beam 25 bears upon the base 28 of the headless screw 26, thus determining a stable positioning (end of travel) of the latter completely within the seat 24. In this way, the tubular section 23 may be freely slid off the attachment 22, given that any interference of the headless screw 26 in the path of the tubular section 23 is certainly excluded.

[0033] A stable fixing is thus achieved even over time, which, however, can be released by simply unscrewing the headless screw 26 and then bringing the beam 25 back into the original position shown in Figures 3, 6 and 8.

[0034] The purpose mentioned in the introductory part of the description is thus achieved.

[0035] The scope of protection of the invention is therefore delimited by the attached claims.

Claims

1. Joining device for the creation of load-bearing systems for workstations of the type comprising, in combination: a body (21) from which there extends an attachment (22) on which a tubular section (23) is designed to be fitted, and fixing means capable of joining said attachment (22) and tubular section (23) stably together, characterized in that said fixing means consist of at least one beam (25) acting between said attachment (22) and tubular section

(23), said beam (25) being housed within a seat (24) of said body (21) and being movable between one first position in which the beam (25) is basically contained within the seat (24) and one second position in which the beam (25) is loaded, by adjustment means, to push the attachment (22) and the tubular section (23) so that they engage with one another.

2. Device according to Claim 1, characterized in that said beam (25) is housed within a complementary seat (24) and moves parallel to itself, controlled by said adjustment means.

3. Device according to Claim 1, characterized in that the attachment (22) and the tubular section (23) engage with one another at a common perimetral surface (45) which basically occupies almost their entire cross section, except for the area in which said beam (25) acts.

4. Device according to Claim 1, characterized in that said beam (25) is a double-T-section beam and moves within a complementary seat (24).

5. Device according to Claim 1, characterized in that said adjustment means consist of a headless screw (26, 31) housed in said seat (24), which is screwed through a threaded hole (27) in said beam (25).

6. Device according to Claim 5, characterized in that said headless screw (26) is accessible through an aligned hole (32) of the tubular section (23) fitted on the attachment (22).

7. Device according to Claim 5, characterized in that said headless screw (26) has a base (28) snap-fitted within a corresponding cavity (29) on the bottom of the seat (24).

8. Device according to Claim 7, characterized in that against said base (28) is engaged the beam (25), thus determining a position of end of travel for said headless screw (26).

9. Device according to Claim 1, characterized in that said body (21) also comprises means (34, 35, 36; 37, 38, 39) for stable fixing of a tubular leg (33).

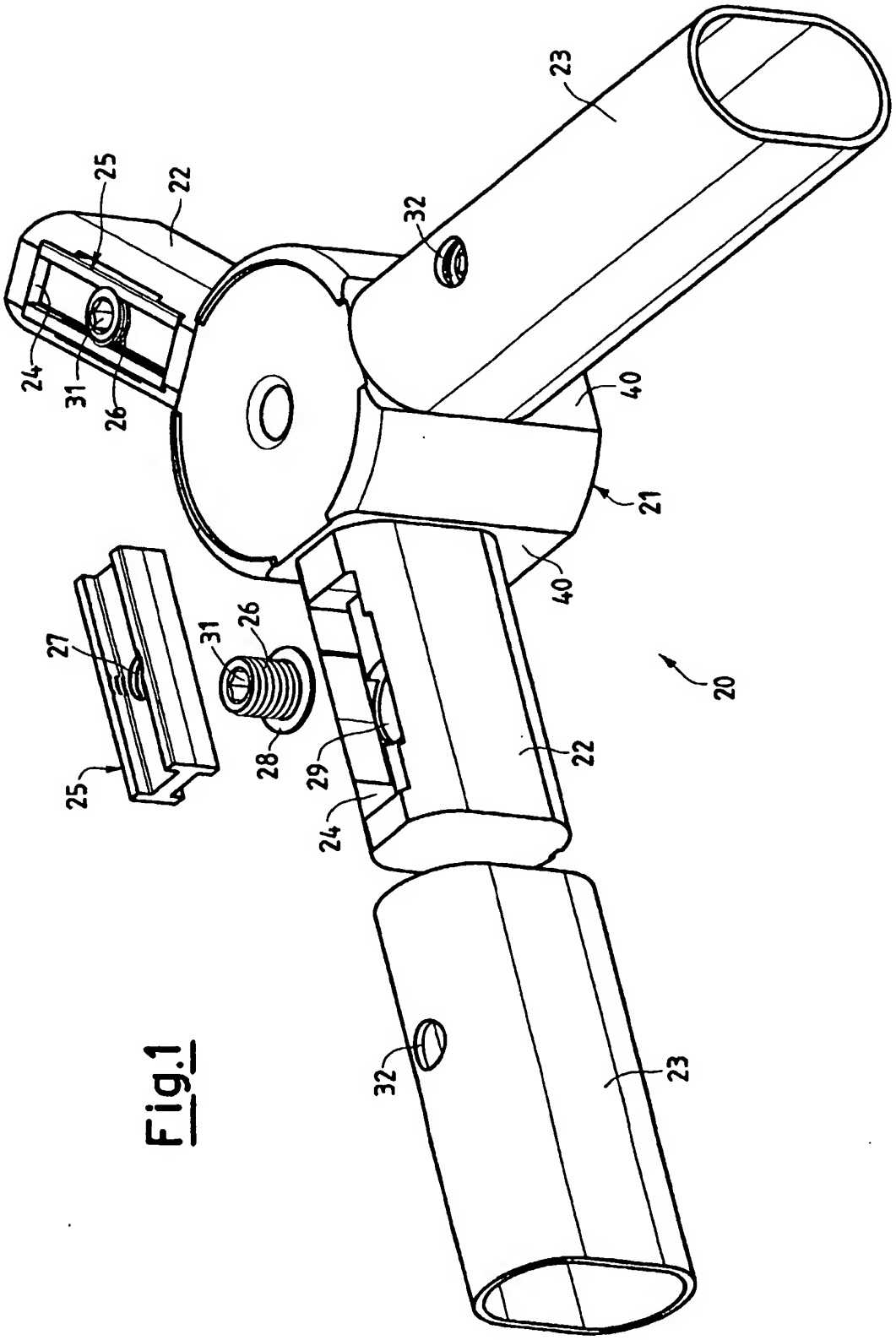


Fig.1

Fig.7

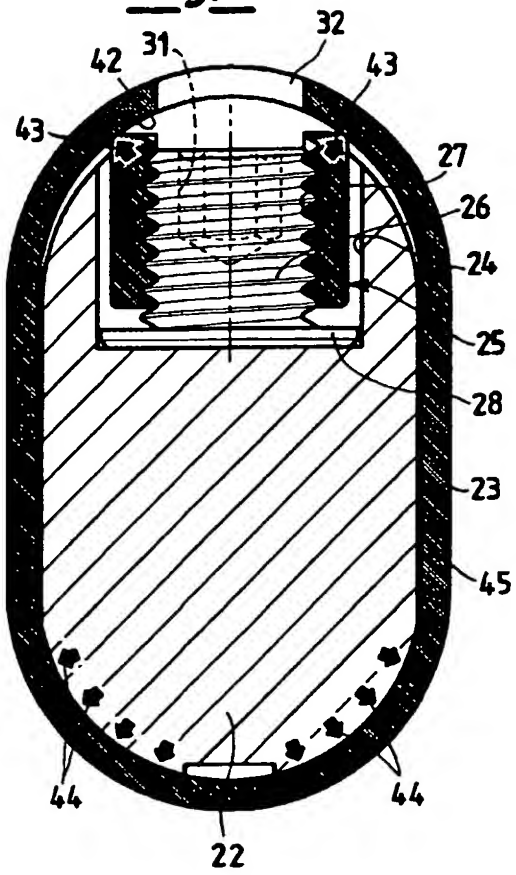


Fig.6

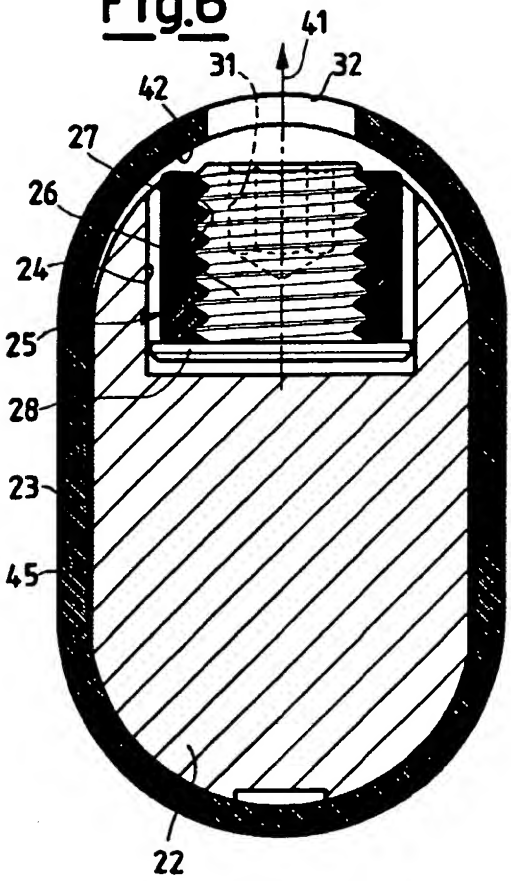


Fig.2

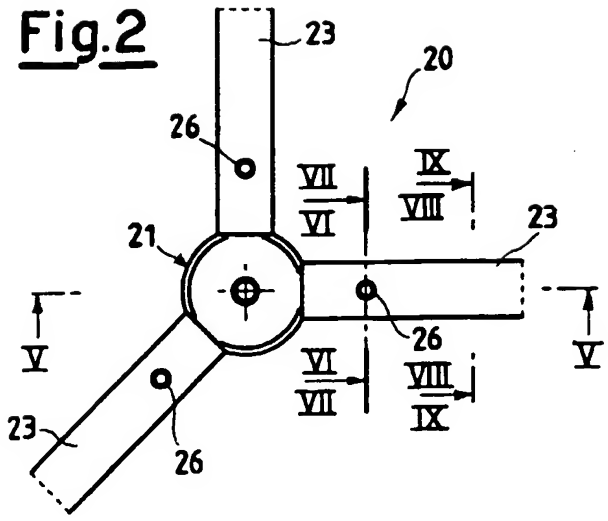
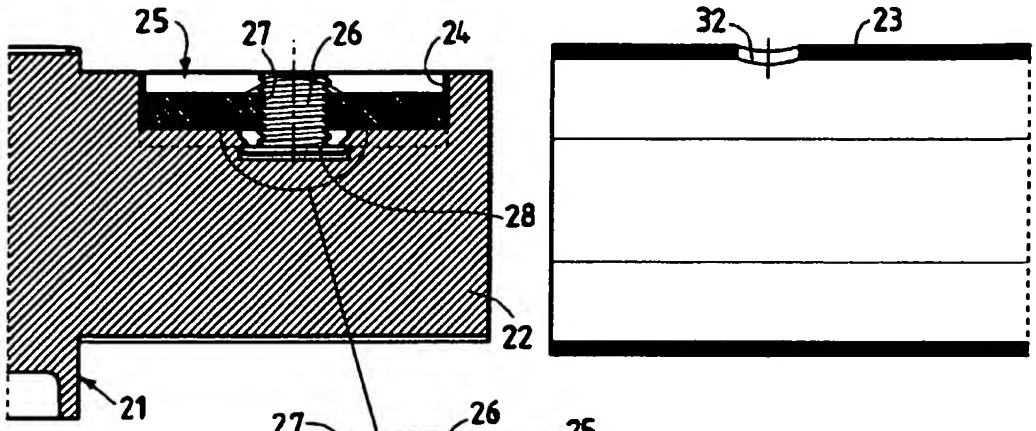


Fig.3



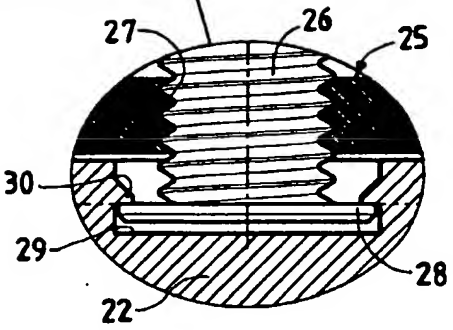


Fig.4

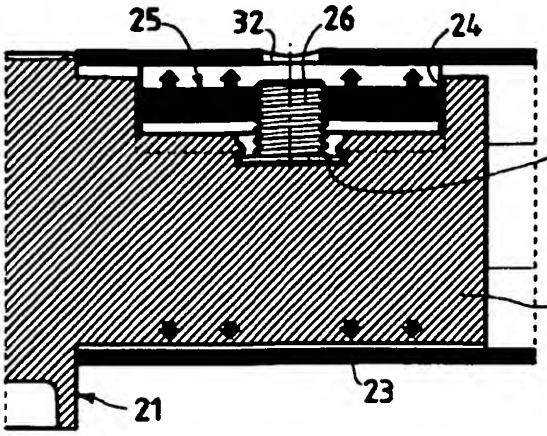


Fig.5

Fig.9

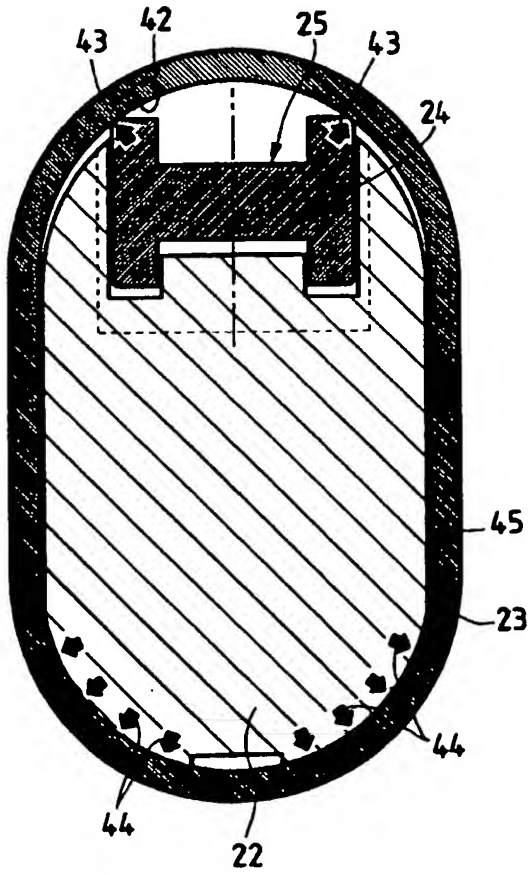
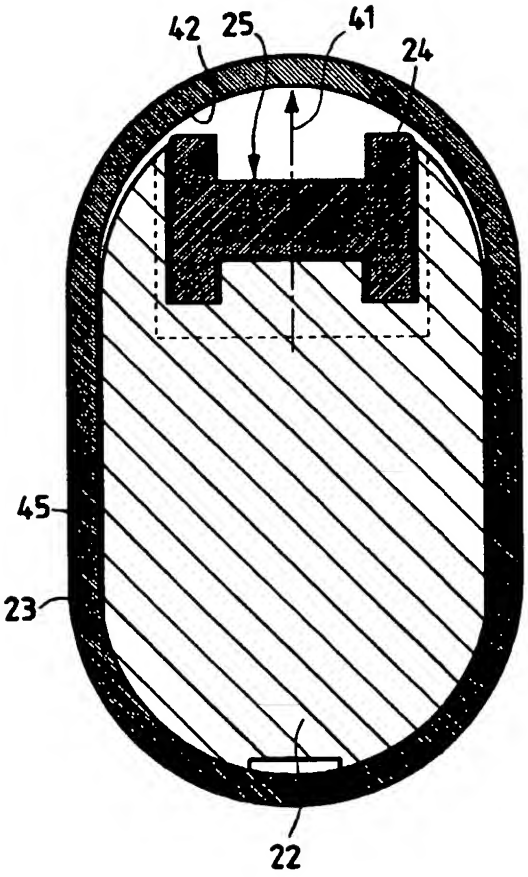


Fig.8



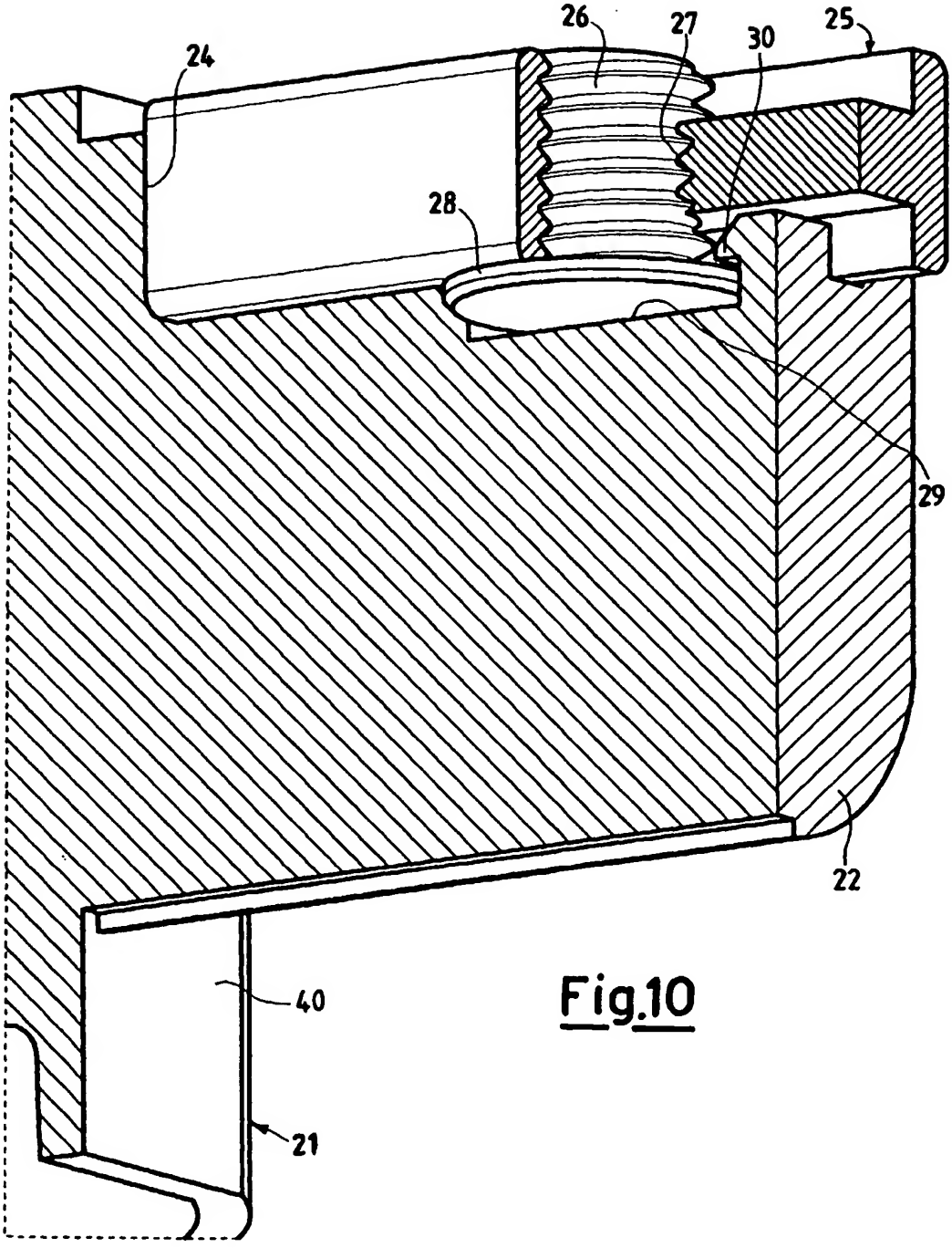


Fig.10

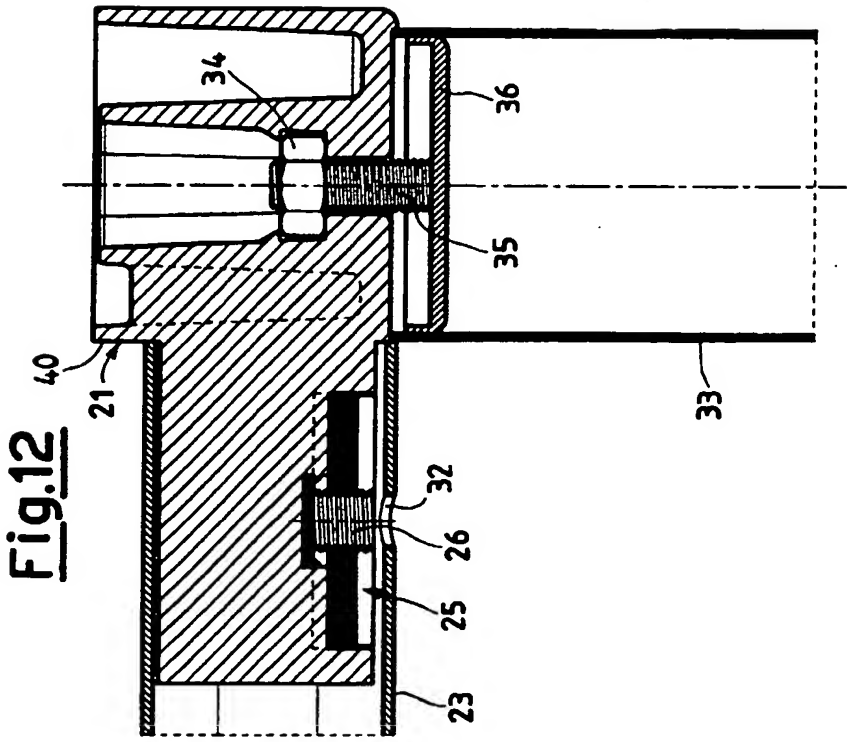


Fig.12

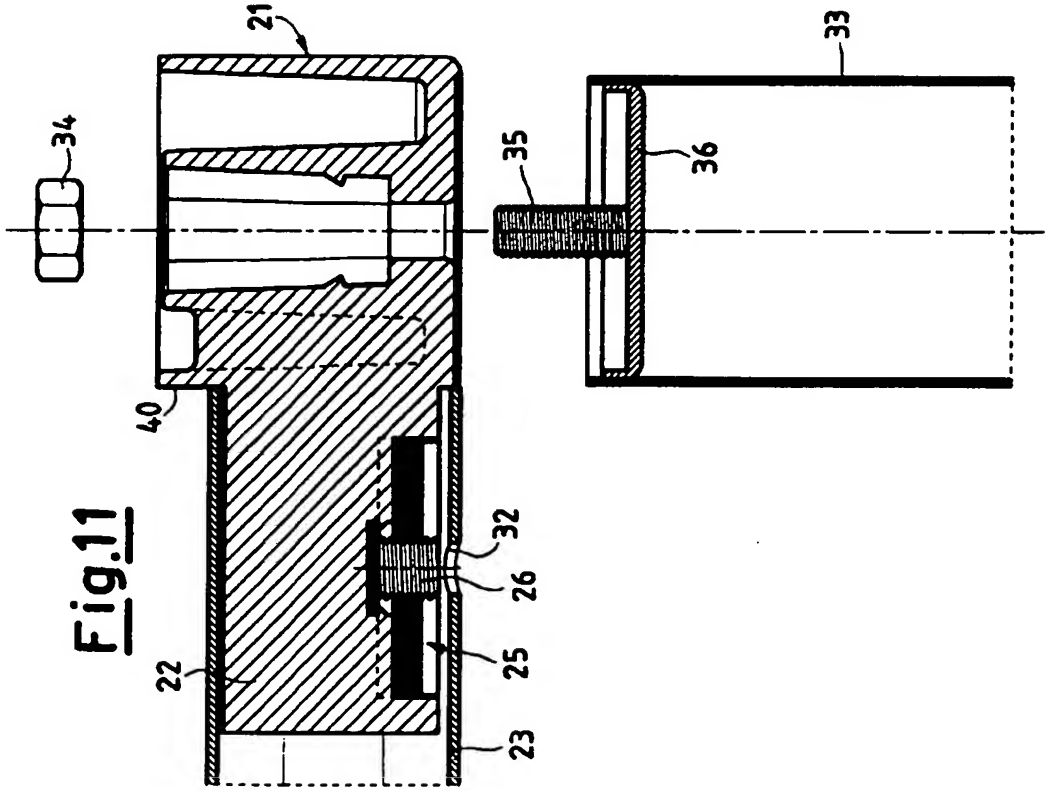


Fig.11

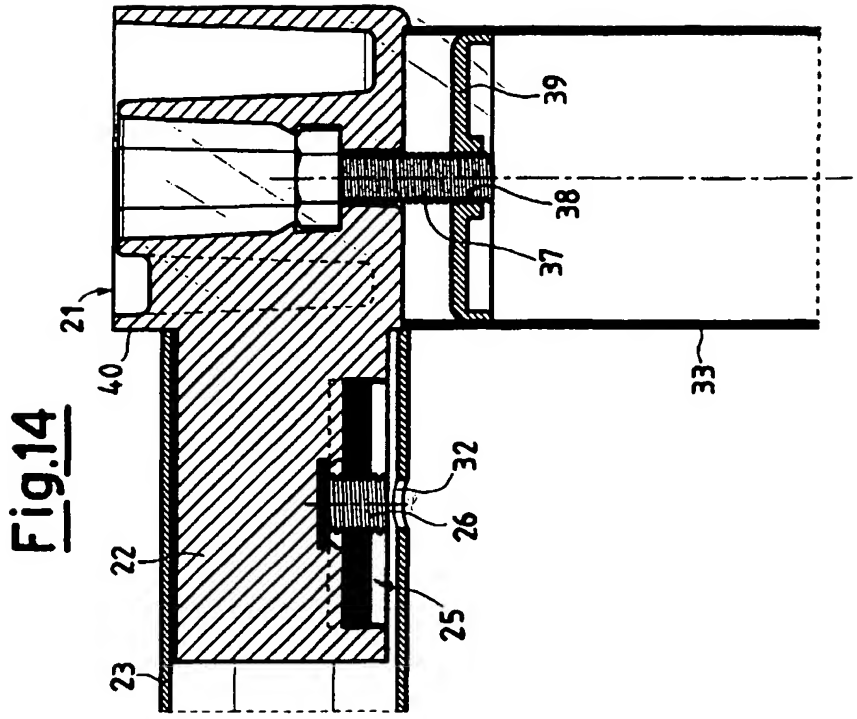


Fig.14

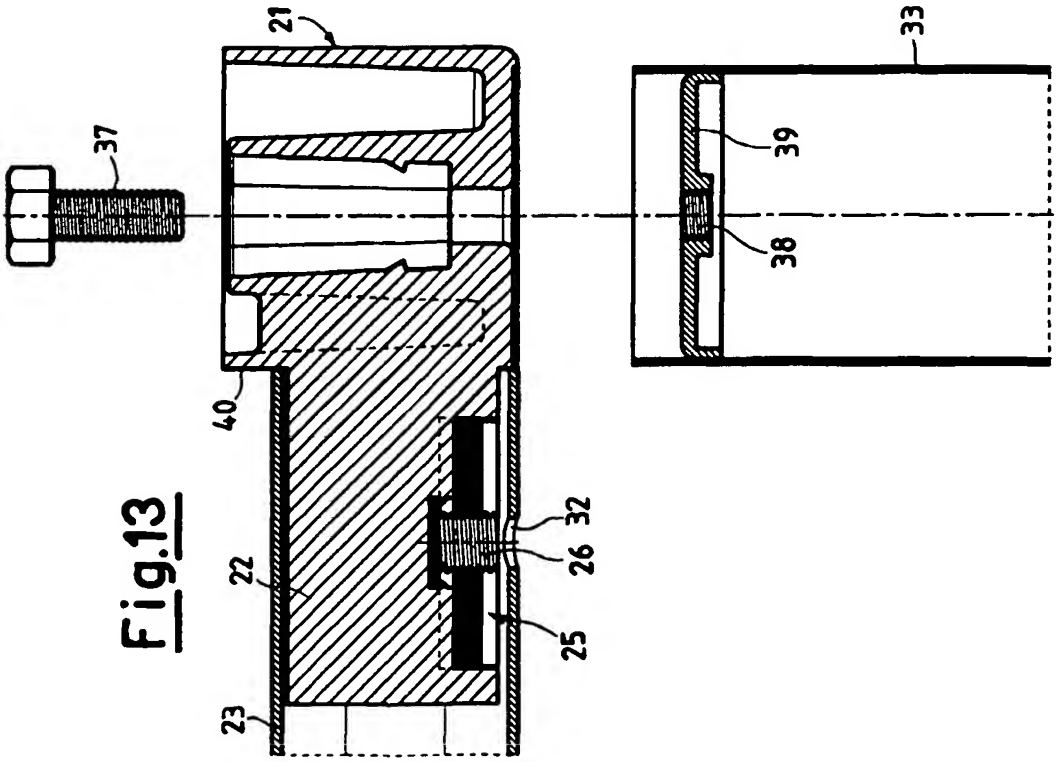


Fig.13

Fig.19

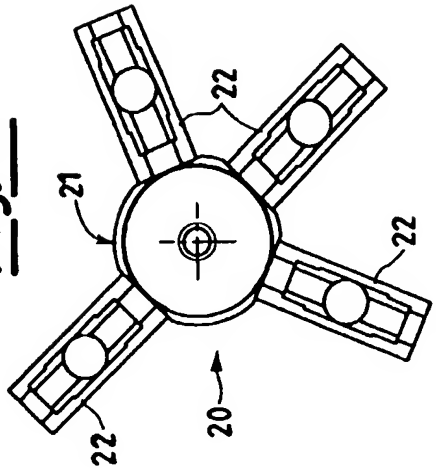


Fig.18

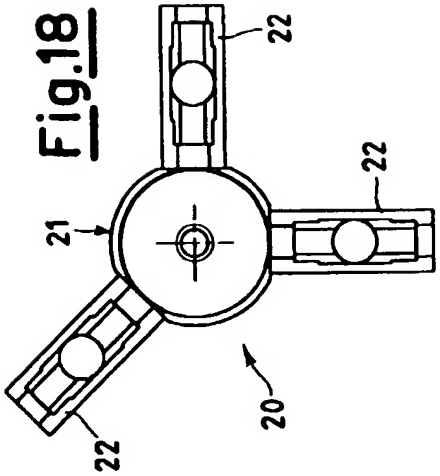


Fig.17

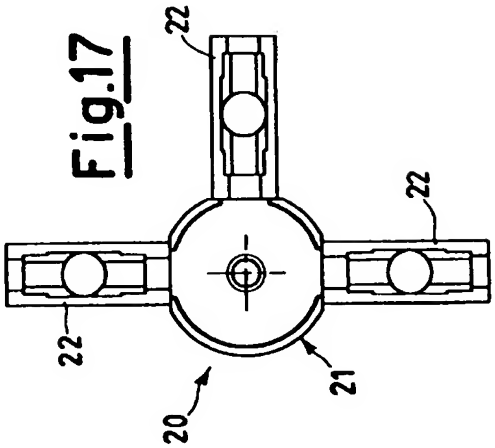


Fig.16

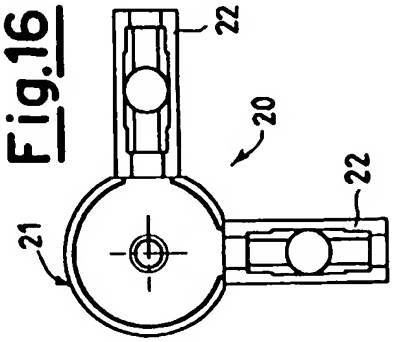


Fig.15